REMARKS

Claims 2, 7-11, and 26-33 are pending herein.

1. Claims 2, 7-11, and 26-33 were rejected under 35 U.S.C. 103(a) as being unpatentable over Iijima (2001/0006042) in view of Vaidya (US 5076203). Claims 2, 7-11, and 26-33 were rejected under 35 U.S.C. 103(a) as being unpatentable over Iijima in view of Vaidya and further in view of Madocks (US 7025833). These rejections are respectfully traversed for the following reasons.

Claim 2 is drawn to an IBAD apparatus for cooling and positioning a substrate during a continuous high-throughput coating deposition processes. The apparatus includes a transport system for translating a substrate along a first direction and a substrate block having both internal liquid coolant channels and internal gaseous coolant delivery channels. Additionally, the substrate block includes a sapphire wave guide optically connected to a pyrometer configured to measure a temperature of the substrate. The sapphire wave guide and the pyrometer allow for the measurement of the temperature of the substrate without physically contacting the translating substrate. Temperature measurement devices that require physical contact with the tape can provide inaccurate readings due to the translation of the tape,.

Claim 26 is also drawn to an IBAD apparatus for cooling and positioning a substrate during a continuous high-throughput coating deposition processes. Claim 26 specifically requires that the first surface of the substrate block has a radius of curvature of about 20 feet. During the IBAD process, an ion beam impinges upon the depositing layer to induce a texture within the depositing layer. The angle of the ion beam is critical to the formation of the texture within the depositing layer. The shallow curvature of the substrate block ensures that the incident angle of the ion beam is substantially constant over the entire deposition zone while maintaining good contact between the substrate and the substrate block along the length of the substrate block.

Similarly, claim 33 is drawn is to an IBAD apparatus for cooling and positioning a substrate during a continuous high-throughput coating deposition processes including the sapphire wave guide and the pyrometer as discussed above. Further, the first surface of the

substrate block has a radius of curvature of about 20 feet. Additionally, the IBAD apparatus of claim 33 includes a controller configured to alter the flow of a gas through the gaseous coolant delivery channels in response to the temperature measured by the pyrometer.

Iijima discloses an IBAD apparatus including a transport system and a substrate block. However, as acknowledged by the USPTO, Iijima fails to teach that the substrate block includes internal gaseous coolant delivery channels. Additionally, Iijima does not disclose either a radius of curvature of about 20 feet, or a sapphire wave guide and pyrometer for measuring the temperature of the substrate. Significantly, the substrate block of Iijima appears to be substantially flat. Accordingly, Iijima does not suggest to one of ordinary skill in the art the issues related to excessive curvature of the substrate block that are overcome by having a radius of curvature of about 20 feet.

Vaidya discloses an apparatus for depositing material on thin plastic webs. The apparatus includes a substrate block such as a drum having gas channels supplying a porous block with a gaseous coolant. Vaidya discloses the drum has a diameter of the order of 1.5 meters (radius of curvature of about 2.5 feet) rather than the claimed radius of curvature of about 20 feet. Significantly, the process of Vaidya does not utilize a ion beam to impart a texture upon the depositing film. Accordingly, Vaidya does not recognize the problems associated with a substrate block with a small radius of curvature when using an ion beam to impart a texture to the depositing film. Additionally, Vaidya fails to disclose a sapphire wave guide and pyrometer for measuring the temperature of the substrate.

Similar to Vaidya, Madocks discloses a drum for cooling a web substrate during deposition of a coating. The drum of Madocks discloses channels in the surface of the drum for delivering a cooling gas to the backside of the substrate. However, Madocks fails to disclose the radius of curvature of about 20 feet or the sapphire wave guide and pyrometer for measuring the temperature of the substrate. As with Vaidya, Madocks does not utilize an ion beam to impart texture on the depositing film and accordingly does not recognize the specific issues with regard to the radius of curvature in such a process.

Iijima and Vaidya, or Iijima, Vaidya, and Madock, fail to disclose either (i) a substrate block including a sapphire wave guide and a pyrometer configured to measure the temperature of

the substrate, (ii) a substrate block having a surface having a radius of curvature of about 20 feet, or (iii) a controller configured to alter the flow of gas through gaseous coolant delivery channels in the substrate block in response to the temperature of the substrate. As such, the USPTO has failed to establish a prima facie case of obviousness with respect to claim 2, 26, and 33. Claims 7-11 and 25-32 depend directly or indirectly from claims 2 and 26 and are allowable for at least the same reasons as claims 2 and 26. Therefore, Applicants respectfully request withdrawal of the 103(a) rejections over Iijima and Vaidya and Iijima, Vaidya, and Madocks.

Applicants respectfully submit that the present application is now in condition for allowance. Accordingly, the Examiner is requested to issue a Notice of Allowance for all pending claims.

Should the Examiner deem that any further action by the Applicants would be desirable for placing this application in even better condition for issue, the Examiner is requested to telephone Applicants' undersigned representative at the number listed below.

The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 50-3797.

Respectfully submitted,

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Date

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